Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the instant application:

Listing of Claims:

1. (Cancelled) A high speed multiplier comprising a folding multiplier configured to fold multiplicands and multipliers where individual ones of said multiplicands and multipliers exceed a folding threshold, said folding multiplier computing a product of said multiplicands and multipliers based on less than all bits comprising said multiplicands and multipliers.

2. (Cancelled) The high speed multiplier of claim 1, further comprising a conventional multiplier and at least one additional folding multiplier, each of said multipliers being individually, selectably activatable.

3. (Cancelled) A folding multiplication method for reducing power dissipation when multiplying a multiplicand and multiplier in a computing device, said method comprising the steps of:

identifying a folding threshold below which multiplicands and multipliers, when multiplied, cause less power dissipation than that which would be caused in a conventional multiplication;

determining whether either of the multiplicand or the multiplier exceed said folding threshold, and establishing a first non-zero scaling factor for the multiplicand if the multiplicand exceeds said folding threshold, and a second non-zero scaling factor for the multiplier if the multiplier exceeds said folding threshold;

averaging the multiplicand and multiplier and computing a value equivalent to one-half of the difference of the multiplicand and multiplier;

squaring a first operand, said first operand being equal to said average less a fractional portion of said first scaling factor, squaring a second operand, said second operand being equal to said computation value less a fractional portion of said second scaling factor, squaring a third operand, said third operand being equal to said fractional portion of said first scaling factor, and squaring a fourth operand, said fourth operand being equal to said fractional portion of said second scaling factor;

multiplying said first scaling factor by said average, said multiplication resulting in a first product, and further multiplying said second scaling factor by said computed value, said further multiplication resulting in a second product; and,

summing said squared first operand, said first product and said squared fourth operand, and subtracting from said sum, said squared second operand, said second product and said squared third operand, said subtraction producing a folded product.

4. (Cancelled) The folding method of claim 3, further comprising performing said squaring of said first operand and said multiplication using a value of zero for said first scaling factor only if said average evaluates equal to or below said folding threshold, and performing said squaring of said second operand and said further multiplication using a value of zero for said second scaling factor only if said computed value evaluates equal to or below said folding threshold.

5. (Cancelled) A machine readable storage having stored thereon a computer program, said computer program comprising a routine set of instructions for causing the machine to perform the steps of:

identifying a folding threshold below which multiplicands and multipliers, when multiplied, cause less power dissipation than that which would be caused in a conventional multiplication;

determining whether either of the multiplicand or the multiplier exceed said folding threshold, and establishing a first non-zero scaling factor for the multiplicand if the multiplicand exceeds said folding threshold, and a second non-zero scaling factor for the multiplier if the multiplier exceeds said folding threshold;

averaging the multiplicand and multiplier and computing a value equivalent to one-half of the difference of the multiplicand and multiplier;

squaring a first operand, said first operand being equal to said average less a fractional portion of said first scaling factor, squaring a second operand, said second operand being equal to said computation value less a fractional portion of said second scaling factor, squaring a third operand, said third operand being equal to said fractional portion of said first scaling factor, and squaring a fourth operand, said fourth operand being equal to said fractional portion of said second scaling factor;

multiplying said first scaling factor by said average, said multiplication resulting in a first product, and further multiplying said second scaling factor by said computed value, said further multiplication resulting in a second product; and,

summing said squared first operand, said first product and said squared fourth operand, and subtracting from said sum, said squared second operand, said second product and said squared third operand, said subtraction producing a folded product.

6. (Cancelled) The machine readable storage of claim 5, further comprising performing said squaring of said first operand and said multiplication using a value of zero for said first scaling factor only if said average evaluates equal to or below said folding threshold, and performing said squaring of said second operand and said further

multiplication using a value of zero for said second scaling factor only if said computed value evaluates equal to or below said folding threshold.

7. (Currently Amended) A high-speed scalable multiplier comprising:

a first signal input for receiving a first signal representing a ~~pre-selected~~ a multiplicand value;

a second signal input for receiving a second signal representing a ~~pre-selected~~ a multiplier value; and

~~at least one folding multiplier for performing a folding process on the pre-selected multiplicand and multiplier to thereby generate a folded product~~;

~~wherein said folding process is based upon first and second folding values, and first and second scaling factors~~

a folding multiplier having circuitry for multiplying the multiplicand value times the multiplier value by

generating a first folding value and a second folding value based upon the multiplicand and multiplier values, the first folding value being equal to one half times a sum of the multiplicand value and the multiplier value, and the second folding value being equal to one half times a difference between the multiplicand value and the multiplier value,

generating a first square by squaring the difference between the first folding value and a fractional portion of a first scaling factor, the first scaling factor being equal to (a) one times a predetermined full scale value if the first folding value is greater than one half the full scale value and (b) zero if the first folding value is less than or equal to one half the full scale value,

generating a second square by squaring the difference between the second folding value and a fractional portion of a second scaling factor, the second scaling factor being equal to (a) one times the full scale value if the second folding value

is greater than one half the full scale value and (b) zero if the second folding value is less than or equal to one half the full scale value,

generating a first product by multiplying the first folding value times the first scaling factor,

generating a second product by multiplying the second folding value times the second scaling factor,

generating a third square by squaring the fractional portion of the first scaling factor,

generating a fourth square by squaring the fractional portion of the second scaling factor, and

determining a folded product by generating a sum of the first square, the first product, and the fourth square, and subtracting from the sum the second square, the second product, and the third square.

8. (Currently Amended) The high-speed scalable multiplier of Claim 7, ~~said at least one folding multiplier comprises a 32x32 folding multiplier, a 16x16 folding multiplier, and an 8x8 folding multiplier~~ further comprising at least one additional folding multiplier and a conventional multiplier, each of said at least one additional folding multiplier and conventional multiplier being individually and selectively activatable.

9. (Currently Amended) A high-speed scalable multiplier comprising:

at least one multiplier;

at least one folding multiplier ~~for performing a folding process based upon first and second folding values, and first and second scaling factors~~ having a first signal input for receiving a first signal representing a multiplicand value, a second signal input for receiving a second signal representing a multiplier value, and a folding multiplier having circuitry for multiplying the multiplicand value times the multiplier value by

generating a first folding value and a second folding value based upon the multiplicand and multiplier, the first folding value being equal to an average of the multiplicand and the multiplier and the second folding value being equal to one half the difference between the multiplicand and the multiplier,

generating a first square by squaring the difference between the first folding value and a fractional portion of a first scaling factor, the first scaling factor being equal to (a) one times a predetermined full scale value if the first folding value is greater than one half the full scale value and (b) zero if the first folding value is less than or equal to one half the full scale value,

generating a second square by squaring the difference between the second folding value and a fractional portion of a second scaling factor, the second scaling factor being equal to (a) one times the full scale value if the second folding value is greater than one half the full scale value and (b) zero if the second folding value is less than or equal to one half the full scale value,

generating a first product by multiplying the first folding value times the first scaling factor,

generating a second product by multiplying the second folding value times the second scaling factor,

generating a third square by squaring the fractional portion of the first scaling factor,

generating a fourth square by squaring the fractional portion of the second scaling factor, and

determining a folded product by generating a sum of the first square, the first product, and the fourth square, and subtracting from the sum the second square, the second product, and the third square; and

at least one decoder for dynamically selecting between the at least one multiplier and at least one folding multiplier .

10. (Previously Presented) The high-speed scalable multiplier of Claim 9, wherein the dynamic selection by said at least one decoder is based upon a comparison of respective power efficiencies of the at least one multiplier and the at least one folding multiplier.

11. (Currently Amended) A machine-readable storage medium, the storage medium comprising computer instructions for:

determining a <u>first numerical value defining a</u> multiplicand <u>value, the determining of the multiplicand value</u> based upon a first electrical signal;

determining a <u>second numerical value defining a</u> multiplier <u>value, the determining of the multiplier value</u> based upon a second electrical signal;

generating a first folding value ~~based on an average~~ <u>equal to one half times a sum</u> of the multiplicand and the multiplier;

generating a second folding value ~~based on~~ one-half <u>times</u> a difference ~~of~~ <u>between</u> the multiplicand <u>value</u> and the multiplier <u>value</u>;

generating a first square based upon a squaring of a difference between the first folding value and a portion of a first scaling factor;

generating a second square based upon a squaring of a difference between the second folding value and a portion of a second scaling factor;

generating a third square based upon a squaring of the portion of the first scaling factor;

generating a fourth square based upon a squaring of the portion of the second scaling factor;

generating a first product based upon a product of the first folding value times the first scaling factor;

generating a second product based upon a product of the second folding value times the second scaling factor;

generating a first sum by summing the first square, first product and fourth square;

generating a second sum by summing the second square, second product, and third square; and

generating a difference by subtracting the second sum from the first sum;

wherein the first factor is zero if the multiplicand is less than a predetermined threshold, and wherein the second factor is zero if the multiplier is less than the predetermined threshold.

12. (Previously Presented) The computer readable storage medium of Claim 11, further comprising a computer instruction for performing at least one of iteratively folding the multiplicand by dividing the first folding value by two if the multiplicand is greater than the predetermined threshold, and iteratively folding the multiplier by dividing the second folding value by two if the multiplier is greater than the predetermined threshold.

13. (New) A method of multiplying a multiplicand and multiplier in a computing device, said method comprising the steps of:

generating a first folding value and a second folding value based upon a first electrical signal representing a numerical value of the multiplicand and a second numerical signal representing a numerical value of the multiplier, the first folding value being equal to one half times a sum of the numerical values of the multiplicand and the multiplier and the second folding value being equal to one half times a difference between the numerical values of the multiplicand and the multiplier;

generating a first square by squaring the difference between the first folding value and a fractional portion of a first scaling factor, the first scaling factor being equal to (a) one times a predetermined full scale value if the first folding value is greater than one

half the full scale value and (b) zero if the first folding value is less than or equal to one half the full scale value;

generating a second square by squaring the difference between the second folding value and a fractional portion of a second scaling factor, the second scaling factor being equal to (a) one times the full scale value if the second folding value is greater than one half the full scale value and (b) zero if the second folding value is less than or equal to one half the full scale value;

generating a first product by multiplying the first folding value times the first scaling factor;

generating a second product by multiplying the second folding value times the second scaling factor;

generating a third square by squaring the fractional portion of the first scaling factor;

generating a fourth square by squaring the fractional portion of the second scaling factor; and

determining a folded product by generating a sum of the first square, the first product, and the fourth square, and subtracting from the sum the second square, the second product, and the third square.